

Eiju SUZUKI, et al.

Q97624

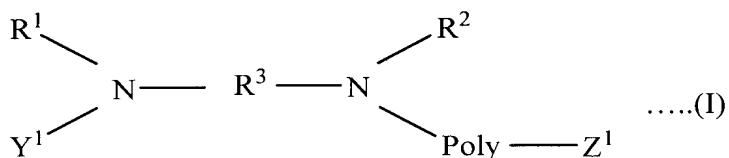
PRELIMINARY AMENDMENT

AMENDMENTS TO THE CLAIMS

**This listing of claims will replace all prior versions and listings of claims in the application:**

**LISTING OF CLAIMS:**

1. (original) A modified conjugated diene polymer comprising a homopolymer of a conjugated diene compound or a copolymer of a conjugated diene compound and an aromatic vinyl compound and characterized by the following formula (I):



(wherein R<sup>1</sup> and R<sup>2</sup> are independently an alkyl or aryl group having a carbon number of 1-20, a substituted silyl group or a hydrogen atom; R<sup>3</sup> is an alkylene or arylene group having a carbon number of 1-12 provided that it may include a hetero atom unless it has not an active proton; Y<sup>1</sup> is a substituted silyl group or a hydrogen atom; a part of R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup> and Y<sup>1</sup> may be bonded to each other to form a cyclic structure; Poly is a homopolymer part of a conjugated diene compound or a copolymer portion of a conjugated diene compound and an aromatic vinyl compound; Z<sup>1</sup> is an alkali metal or an alkaline earth metal, or a residue produced by reacting with a carbanion reactive compound, or a hydrogen atom).

2. (original) A modified conjugated diene polymer according to claim 1, wherein R<sup>2</sup> in the formula (I) is an alkyl or aryl group having a carbon number of 1-20.

Eiju SUZUKI, et al.

Q97624

PRELIMINARY AMENDMENT

3. (original) A modified conjugated diene polymer according to claim 1, wherein the conjugated diene compound is 1,3-butadiene or isoprene.

4. (original) A modified conjugated diene polymer according to claim 1, wherein the aromatic vinyl compound is styrene.

5. (original) A modified conjugated diene polymer according to claim 1, wherein said polymer is a copolymer of the conjugated diene compound and the aromatic vinyl compound.

6. (original) A modified conjugated diene polymer according to claim 1, wherein said polymer has a Moony viscosity  $ML_{1+4}$  (100°C) of 10-150.

7. (original) A modified conjugated diene polymer according to claim 1, wherein said polymer is a modified conjugated diene polymer obtained by modifying a modified conjugated diene polymer wherein  $Z^1$  in the formula (I) is an alkali metal or an alkaline earth metal with a carbanion reactive compound, in which  $Z^1$  in the formula (I) is a residue produced by reacting with the carbanion reactive compound.

8. (original) A modified conjugated diene polymer according to claim 7, wherein the carbanoin reactive compound used in the modification is a compound including at least one of  $C=X$  ( $X$  is O, S or C) and an epoxy group as a carbanion reaction site and a nitrogen-containing functional group, a silicon-containing compound, or a tin-containing compound.

9. (original) A modified conjugated diene polymer according to claim 8, wherein the carbanion reactive compound used in the modification is at least one selected from the group consisting of 4-dimethylamino benzophenone, 4-diethylamino benzophenone, 4,4'-

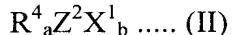
Eiju SUZUKI, et al.

Q97624

PRELIMINARY AMENDMENT

bis(dimethylamino) benzophenone, 4,4'-bis(diethylamino) benzophenone, 4-dimethylamino benzaldehyde, 4-diethylamino benzaldehyde, 1,1-bis(4-dimethylaminophenyl) ethylene, 1,1-bis(4-diethylaminophenyl) ethylene, 1,1-dimethoxy trimethylamine, 4-dimethylaminobenzylidene aniline, N,N-dimethylformamide, N,N-diethylformamide, N,N-dimethylacetamide, N,N-diethylacetamide, 4-pyridylamide, 4-pyridyl-ethyleneoxide, 4-vinylpyridine, 2-vinylpyridine, dicyclohexyl carbodiimide, ε-caprolactam, N-methyl-ε-caprolactam, 1,3-dimethyl-2-imidazolidinone, N-methylpyrrolidone, pheylisocyanate, pheylthioisocyanate and diisocyanate diphenylmethane.

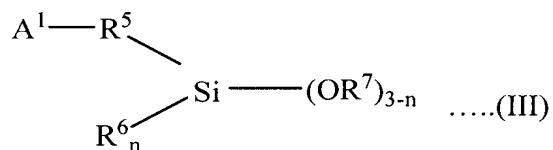
10. (original) A modified conjugated diene polymer according to claim 8, wherein the carbanion reactive compound used in the modification is a coupling agent represented by the following formula (II):



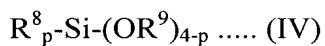
(wherein R<sup>4</sup> is independently selected from an alkyl group having a carbon number of 1-20, a cycloalkyl group having a carbon number of 3-20, an aryl group having a carbon number of 6-20 and an aralkyl group having a carbon number of 7-20; Z<sup>2</sup> is tin or silicon atom; X<sup>1</sup> is independently chlorine or bromine atom; and a is an integer of 0-3 and b is an integer of 1-4 provided that a+b = 4).

11. (original) A modified conjugated diene polymer according to claim 8, wherein the carbanion reactive compound used in the modification is at least one selected from the group consisting of a hydrocarbyloxysilane compound represented by the following formula (III):

Eiju SUZUKI, et al.  
Q97624  
PRELIMINARY AMENDMENT



[wherein  $A^1$  is a monovalent group having at least one functional group selected from (thio)epoxy, (thio)isocyanate, (thio)ketone, (thio)aldehyde, imine, amide, isocyanuric acid triester, (thio)carboxylic acid hydrocarbylester, a metal salt of (thio)carboxylic acid, carboxylic anhydride, a halide of carboxylic acid, carbonic acid dihydrocarbylester, cyclic tertiary amine, non-cyclic tertiary amine, nitrile, pyridine, sulfide, multi-sulfide, an alkali metal salt of amine, an alkaline earth metal salt of amine, silazane and disilazane;  $R^5$  is a single bond or a divalent inactive hydrocarbon group;  $R^6$  and  $R^7$  are independently a monovalent aliphatic hydrocarbon group having a carbon number of 1-20 or a monovalent aromatic hydrocarbon group having a carbon number of 6-18;  $n$  is an integer of 0-2; when plural  $OR^7$ 's are existent, these  $OR^7$ 's may be same or different; active proton and onium salt is not included in the molecule] and/or a partial condensate thereof, and a hydrocarbyloxysilane compound represented by the following formula (IV):

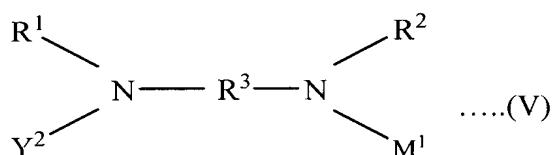


(wherein  $R^8$  and  $R^9$  are independently a monovalent aliphatic hydrocarbon group having a carbon number of 1-20 or a monovalent aromatic hydrocarbon group having a carbon number of 6-18;  $p$  is an integer of 0-2; when plural  $OR^9$ 's are existent, these  $OR^9$ 's may be same or different; active proton and onium salt is not included in the molecule) and/or a partial condensate thereof.

PRELIMINARY AMENDMENT

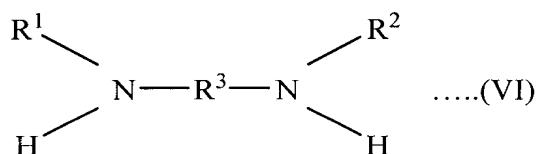
12. (original) A modified conjugated diene polymer characterized by further modifying a modified conjugated diene polymer wherein Y<sup>1</sup> in the formula (I) is a hydrogen atom with at least one of a compound having an isocyanate group and a condensate thereof.

13. (original) A polymerization initiator characterized by the following formula (V):



(wherein R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> are the same mining as mentioned above; Y<sup>2</sup> is a substituted silyl group; a part of R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup> and Y<sup>2</sup> may be bonded to each other to form a cyclic structure; M<sup>1</sup> is an alkali metal or an alkaline earth metal).

14. (original) A polymerization initiator solution characterized by adding a diamine compound represented by the following formula (VI):



(wherein R<sup>1</sup> and R<sup>2</sup> are independently an alkyl or aryl group having a carbon number of 1-20 or a hydrogen atom; R<sup>3</sup> is the same meaning as mentioned above; a part of R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> may be

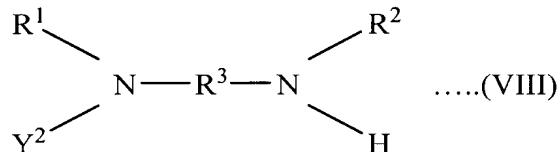
Eiju SUZUKI, et al.  
Q97624  
PRELIMINARY AMENDMENT

bonded to each other to form a cyclic structure) with a silyl compound represented by the following formula (VII):



(wherein Y<sup>2</sup> is the same meaning as mentioned above; X<sup>2</sup> is one selected from a halogen atom, a thioalkyl group having a carbon number of 1-20, cyano group and trifluoromethylsulfonyl group) and adding an organic alkali metal compound or an organic alkaline earth metal compound thereto.

15. (original) A method of producing a polymerization initiator, characterized in that (i) a diamine compound of the formula (VI) is added with a silyl compound of the formula (VII) to form a silylated diamine compound represented by the following formula (VIII):



(wherein R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup> and Y<sup>2</sup> are the same meaning as mentioned above; a part of R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup> and Y<sup>2</sup> may be bonded to each other to form a cyclic structure);

(ii) the said silylated diamine compound is added with an organic alkali metal compound or an organic alkaline earth metal compound to form a polymerization initiator of the formula (V).

16. (original) A method of producing a polymerization initiator according to claim 15, wherein  $X^2$  in the formula (VII) is a halogen atom.

Eiju SUZUKI, et al.

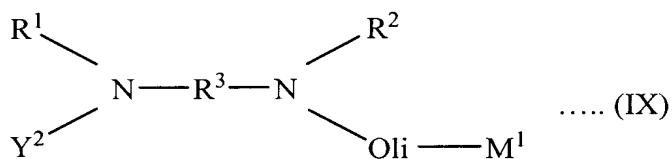
Q97624

PRELIMINARY AMENDMENT

17. (original) A method of producing a modified conjugated diene polymer, characterized in that (i) the diamine compound of the formula (VI) is added with the silyl compound of the formula (VII) to form a silylated diamine compound of the formula (VIII); (ii) the silylated diamine compound is added with the organic alkali metal compound or the organic alkaline earth metal compound to form the polymerization initiator of the formula (V); and (iii) the polymerization initiator is used to polymerize a conjugated diene compound or polymerize a conjugated diene compound and aromatic vinyl compound.

18. (original) A modified conjugated diene polymer obtained by using a polymerization initiator solution as claimed in claim 14 and polymerizing a conjugated diene compound or a conjugated diene compound and an aromatic vinyl compound.

19. (original) A method of producing a modified conjugated diene polymer, characterized in that (i) the diamine compound of the formula (VI) is added with the silyl compound of the formula (VII) to form a silylated diamine compound of the formula (VIII); (ii) the silylated diamine compound is added with the organic alkali metal compound or the organic alkaline earth metal compound to form the polymerization initiator of the formula (V); (iii) the polymerization initiator is added to a solution containing a conjugated diene compound to produce a low molecular weight polymer represented by the following formula (IX):



(wherein R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, Y<sup>2</sup> and M<sup>1</sup> are the same meaning as mentioned above; a part of R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup> and Y<sup>2</sup> may be bonded to each other to form a cyclic structure; Oil is an oligomer or polymer portion formed by polymerizing 3-300 conjugated diene compounds); and

(iv) the low molecular weight polymer is added to a solution containing a conjugated diene compound or a solution containing a conjugated diene compound and an aromatic vinyl compound.

20. (original) A method of producing a modified conjugated diene polymer, characterized in that (i) the diamine compound of the formula (VI) is added with the silyl compound of the formula (VII) to form a silylated diamine compound of the formula (VIII);

(ii) the silylated diamine compound is added to a solution containing a conjugated diene compound or a solution containing a conjugated diene compound and an aromatic vinyl compound; and

(iii) the said solution is further added with an organic alkali metal compound or an organic alkaline earth metal compound.

21. (currently amended) A rubber composition characterized by including a modified conjugated diene polymer as claimed in ~~any one of claims 1 to 12 and 18~~ claim 1 as a rubber component.

Eiju SUZUKI, et al.

Q97624

PRELIMINARY AMENDMENT

22. (original) A rubber composition according to claim 21, wherein a content of the modified conjugated diene polymer is not less than 10% by mass in the rubber component.

23. (original) A rubber composition according to claim 21, which is sulfur-crosslinking.

24. (original) A rubber composition according to claim 21, which is compounded with 10-100 parts by mass in total of carbon black and/or an inorganic filler per 100 parts by mass of the rubber component.

25. (original) A rubber composition according to claim 24, wherein 10-100 parts by mass of silica as the inorganic filler is compounded per 100 parts by mass of the rubber component.